

Tryptophan

Essential amino acid and mixed

Forms niacin- serotonin - melatonin and formylTHF

Sources of 1 carbon unit are Glycine –serine- tryptophan

alanine → indole ring → tryptophan

→ catabolism → tryptophan

histidine and alanine side chain
phenylalanine

→ 2 oxygen → tryptophan
→ formylkynurenine

substrate → 2 oxygen → dioxygenase

substrate → 1 oxygen → monooxygenase

hydroxylase → water →

→ substrate → hydrogen → oxidase

oxygen

→ hydrogen → dehydrogenase

hydrogen carrier → substrate

CHO → formyl group

→ formate → formyl group → water

formyl → 1 carbon unit

THF

VISIT...

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kynurenine

3hydroxykynurenine hydroxylgroup

kynureninase anine side chain

glucogenic RLP

3hydroxyxanthranilate

kynureninase vit B6
xanthurenic acid hydroxykynurenine
urine

kynureninase niacin
niacin

pellagra

Niacin is essential to form vit B3

another vit deficiency vit deficiency

vit B3 vit B6

acetoacetaldehyde hydroxyxanthranilate
tryptophan ketogenic

mixed amino acid

Serotonin

hydroxylation at C5 tryptophan
biopterin

1 decarboxylation 2 3 4 5hydroxytryptophan 6
 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
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amine $\square \square \square \square$ decarboxylation $\square \square \square \square$ amino acid $\square \square$

Serotonin is formed in the neurons and APUD cells and stored in the platelets

Serotonin causes VC and platelets aggregation and psychic stimulation

serotonin reuptake inhibitor

monoamino oxidase serotonin catabolism 5hydroxyindole acetic oxygen amino HAA acid

5-**HT** **serotonin** **tumor in APUD cells** **tryptophan**
pellagra **HIAA**

tumor marker □ □ □ □ □ □ HAA □ □ □ □ □ □ □ □

acetylation pineal body serotonin
melatonin methylation

Nacetyl O methyl serotonin ☐ melatonin ☐ ☐ ☐

in the dark   deep rhythm  

related to the environment
melatonin
to melanin

Hartnup disease

intestinal absorption and renal reabsorption of large neutral amino acids

tryptophan – leucine – isoleucine – valine

niacin
tryptophan

pellagra

putrefaction in intestine
normal bad odor of stool
indole and skatole
stools

intestinal absorption
stools normally

obstruction or constipation

skatoyl sulfate and indoxyl sulfate
liver

urine
soluble

Phenylalanine

Essential – mixed

Tyrosine

Nonessential – mixed

non essential amino acids phenylalanine tyrosine
essential amino acids phenylalanine essential
tyrosine

methionine (essential) cysteine (non essential)

tyrosine phenylalanine BH₄ biotin

non-essential tyrosine biotin

Phenylalanine – phenylalanine hydroxylase – Tetrahydrobiopterin – dihydrobiopterin reductase (reforms tetrahydrobiopterin from NADPH)

phenylalanine hydroxylase tyrosine phenylketonuria PKU

mental retardation – hypopigmentation – mousy phenylalanine – urine odor of urine
phenylpyruvate – phenyllactate – phenylacetate

alanine side chain of phenylalanine

hypopigmentation competitive inhibition of tyrosinase enzyme

mousy odor of urine

tyrosine phenylalanine pathway

alanine side chain α -ketoglutarate $\rightarrow$ **deamination** $\rightarrow$ **tyrosine**
parahydroxyphenylpyruvate $\rightarrow$ **pyruvate** $\rightarrow$ **chain**

tyrosine in urine $\rightarrow$ **aminotransferase** $\rightarrow$ **corneal erosion and palmoplantar keratosis**
homogentisate

hydroxylation, **parahydroxyphenylpyruvate**
reaction $\rightarrow$ **sidechainmoving**, **oxidative decarboxylation**
homogentisate

copper and vitamin C $\rightarrow$ **hydroxylase**

enzyme
parahydroxyphenylpyruvate
parahydroxyphenylacetate and parahydroxyphenyllactate
neonatal tyrosinemia $\rightarrow$ **urine**